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## **FREQUENCY NARROWED HIGH POWER DIODE LASER SYSTEM WITH EXTERNAL CAVITY**

### **ABSTRACT OF THE DISCLOSURE**

A high power diode laser system utilizes an external cavity to narrow the spectral width of a high power multimode diode laser to change the output power normally produced by the diode from a broad spectrum to a very narrow spectrum. The power output of the laser system is concentrated over a narrow spectral range which falls within the useable range for particular applications, such as optical pumping of noble gas samples for magnetic resonance imaging. The output of the diode is received by a collimating element which directs the light on a beam path to a diffraction grating which is oriented at an angle to the incident beam. A portion of the beam may be directed from the diffraction grating to provide useable output light, and a portion of the light incident on the grating is directed back to be focused on the diode to provide feedback to cause the diode to preferentially lase at the wavelength of the light that is fed back. A polarization rotation element may be used to orient the polarization of the light passing through it to control the amount of feedback light.

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